

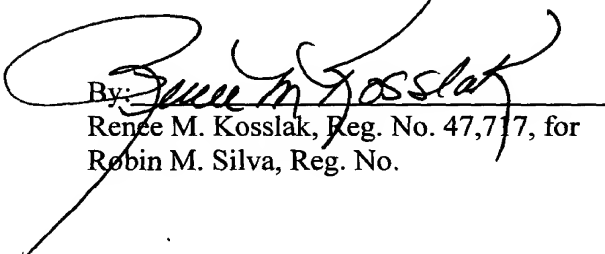
USSN: 08/873,597
Filed: June 12, 1997

Please direct any calls in connection with this application to the undersigned at (415)
781-1989.

Dated: 4/11/02

Respectfully submitted,

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"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

Claim 20 has been amended as follows:

20. (Thrice Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

- a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises a covalently attached single stranded nucleic acid, wherein said electrode further comprises a passivation agent monolayer and wherein said nucleic acid further comprises a covalently attached ~~first~~second electron transfer moiety; and
- b) an AC/DC voltage source electrically connected to said test chamber.

Claim 26 has been amended as follows:

26. (Twice Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

- a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises a covalently attached first single stranded nucleic acid and a passivation agent monolayer;
- b) a second nucleic acid covalently attached to an electron transfer moiety; and
- c) an AC/DC voltage source electrically connected to said test chamber.

APPENDIX OF PENDING CLAIMS

19. (Thrice Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

- a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises a single stranded nucleic acid covalently attached to said electrode via a spacer, wherein said electrode further comprises a passivation agent monolayer; and
- b) an AC/DC voltage source electrically connected to said first and second measuring electrodes.

20. (Thrice Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

- a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises a covalently attached single stranded nucleic acid, wherein said electrode further comprises a passivation agent monolayer and wherein said nucleic acid further comprises a covalently attached first electron transfer moiety; and
- b) an AC/DC voltage source electrically connected to said test chamber.

21. An apparatus according to claim 19, 20 or 26, further comprising:

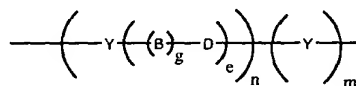
- d) a processor coupled to said electrodes.

22. (Amended) An apparatus according to claim 19, 20 or 26, wherein said AC voltage source is capable of delivering frequencies from between about 1 Hz to about 100 kHz.

23. (Twice Amended) An apparatus according to claim 20, wherein said single stranded nucleic acid is covalently attached to said first electrode via a spacer.

24. An apparatus according to claim 23, wherein said spacer is a conductive oligomer.

25. (Twice Amended) An apparatus according to claim 19, 23 or 27, wherein said spacer is a conductive oligomer having the formula:



wherein

Y is an aromatic group;

n is an integer from 1 to 50;

g is either 1 or zero;

e is an integer from zero to 10; and

m is zero or 1;

wherein when g is 1, B-D comprises two atoms forming a bond able to conjugate with neighboring bonds; and

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wherein when g is zero, e is 1 and D is selected from the group consisting of carbonyl and a heteroatom moiety, wherein the heteroatom is selected from oxygen, sulfur, nitrogen and phosphorus.

26. (Twice Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

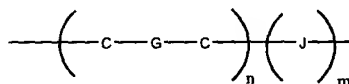
- a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises a covalently attached first single stranded nucleic acid and a passivation agent monolayer;
- b) a second nucleic acid covalently attached to an electron transfer moiety; and
- c) an AC/DC voltage source electrically connected to said test chamber.

27. (Amended) An apparatus according to claim 26 wherein said single stranded nucleic acid is covalently attached to said electrode via a spacer.

28. An apparatus according to claim 27, wherein said spacer is a conductive oligomer.

29. An apparatus according to claim 27, wherein said spacer is an insulator.

30. An apparatus according to claim 19, 23 or 27, wherein said spacer is a conductive oligomer having the formula:



wherein

C are carbon atoms;

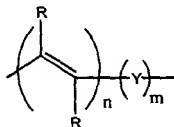
n is an integer from 1 to 50;

m is 0 or 1;

J is a heteroatom selected from the group consisting of nitrogen, silicon, phosphorus, sulfur, carbonyl and sulfoxide; and

G is a bond selected from single, double and triple bonds.

31. (Amended) An apparatus according to claim 19, 23 or 27, wherein said spacer is a conductive oligomer having the formula:



wherein

n is an integer from 1 to 50;

m is either zero or 1;

Y is an aromatic group; and

R is a substitution group.

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33. (Amended) An apparatus according to claim 19, 20 or 26 wherein said passivation agent monolayer comprises conductive oligomers.

34. An apparatus according to claim 19, 20 or 26 wherein said passivation agent monolayer comprises insulators.

35. (Amended) An apparatus for the detection of target nucleic acids in a test sample, comprising:

- a) a test chamber comprising an array of electrodes, each electrode comprising a covalently attached single stranded nucleic acid and a passivation agent monolayer; and
- b) an AC/DC voltage source electrically connected to said test chamber.

36. An apparatus according to claim 35 wherein at least one of said single stranded nucleic acids is attached to said electrode via a spacer.

37. An apparatus according to claim 36 wherein said spacer is an insulator.

38. An apparatus according to claim 36 wherein said spacer is a conductive oligomer.

39. An apparatus according to claim 35 wherein said passivation agent monolayer comprises conductive oligomers.

40. An apparatus according to claim 35 wherein said passivation agent monolayer comprises insulators.